

(12) UK Patent Application (19) GB (11) 2 082 647 A

(21) Application No 8124876

(22) Date of filing 14 Aug 1981

(30) Priority data

(31) 1787/80

(32) 25 Aug 1980

(33) Ireland (IE)

(43) Application published 10 Mar 1982

(51) INT CL<sup>3</sup>  
E04B 1/94

(52) Domestic classification E1D 105 112 124 2055  
2103 405 422 501 609  
DGS2 DXS2 F PJ

(56) Documents cited  
GB 2015063A  
GB 1351723  
GB 1260126  
GB 560966

(58) Field of search  
E1D  
E1J  
E1W

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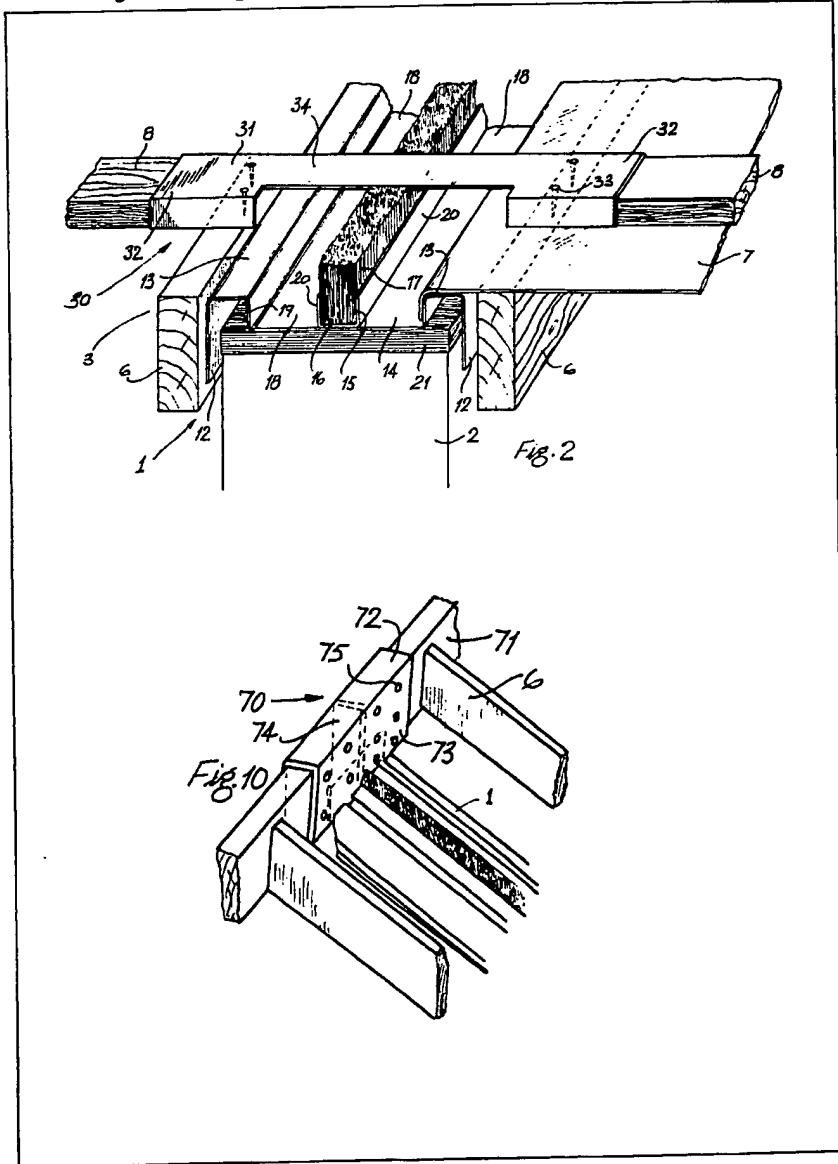
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(54) A fire and smoke barrier

(57) A fire barrier (1) for sealing a gap between a dividing wall (2) and a roof of a building prevents the spread of fire and smoke through the gap. The barrier comprises a body of channel section having side webs (12) for securing to the dividing wall (2). A gasket (17) is

secured in a fixing groove (16) so as to abut the tiles to seal a gap (3). A fire break member (30) is provided to join tiling laths (8) where portions have been removed to prevent the spread of fire. Other fire break members to prevent the spread of fire across other structural members of the building are provided, e.g. a channel section 70 interconnects roof ridge portions 71 and includes an internal plate 74 for separating adjacent ends of the ridge portions 71.



The drawings originally filed were informal and the print here reproduced is taken from a later filed formal copy.

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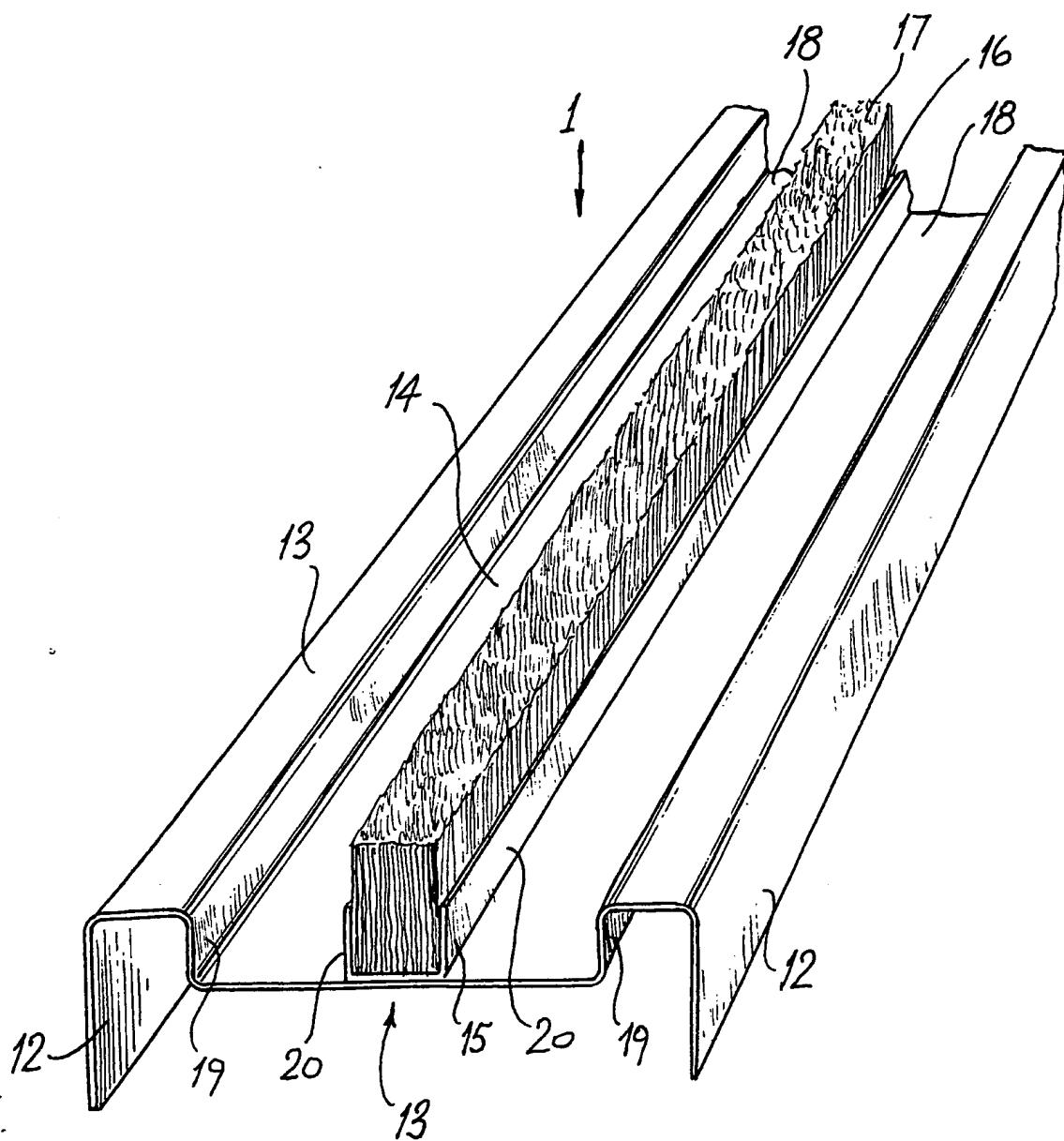
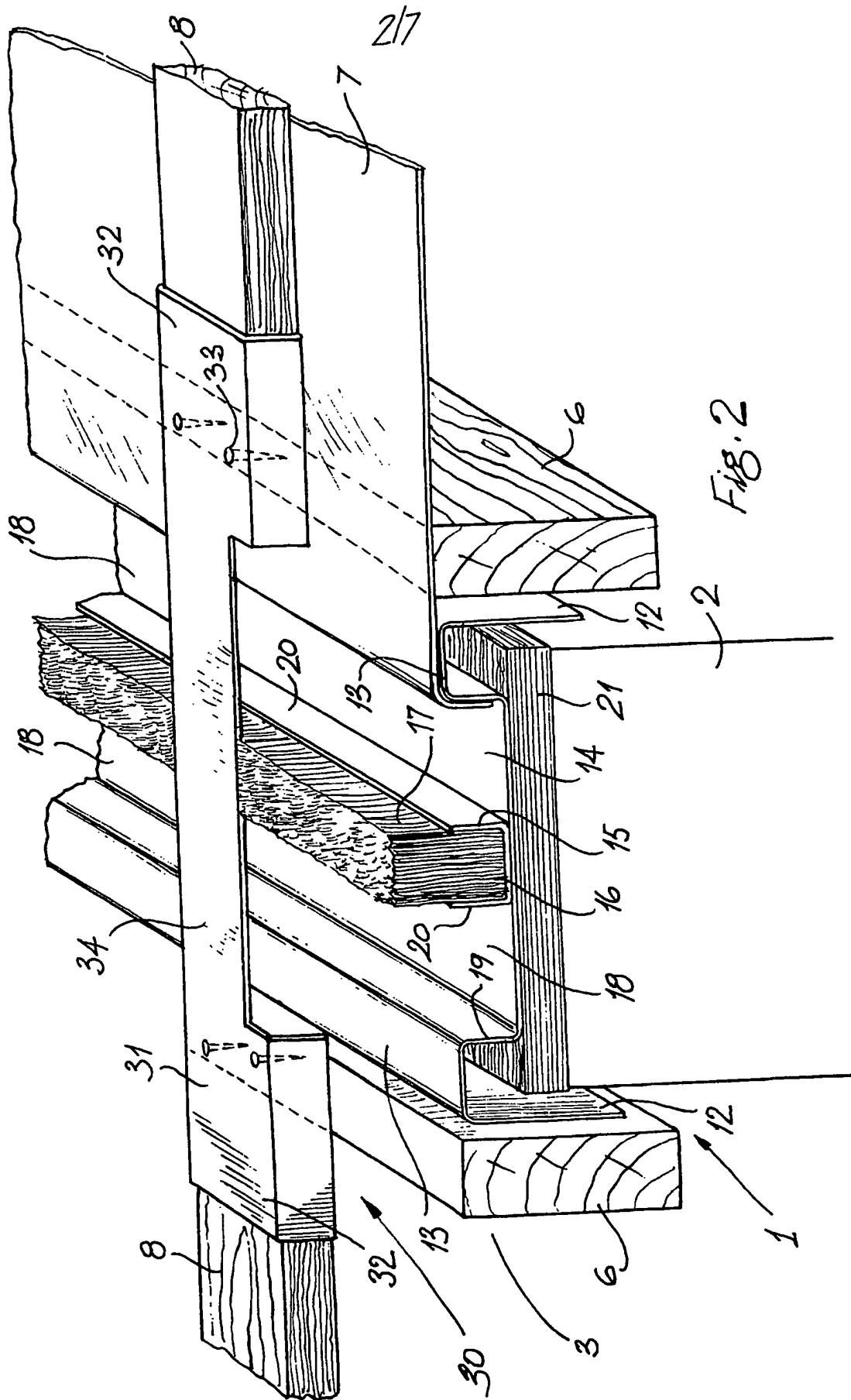
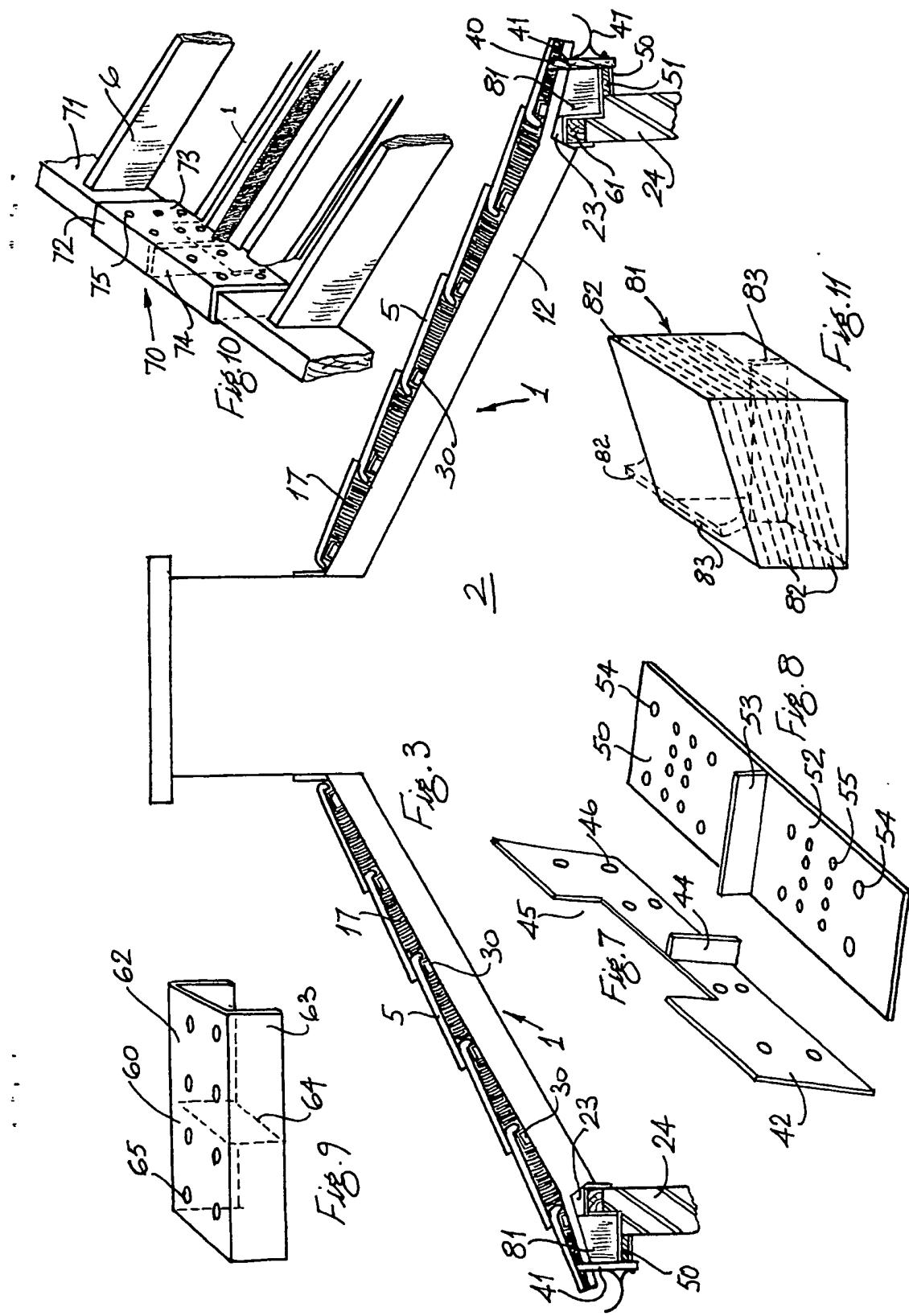


Fig. 1



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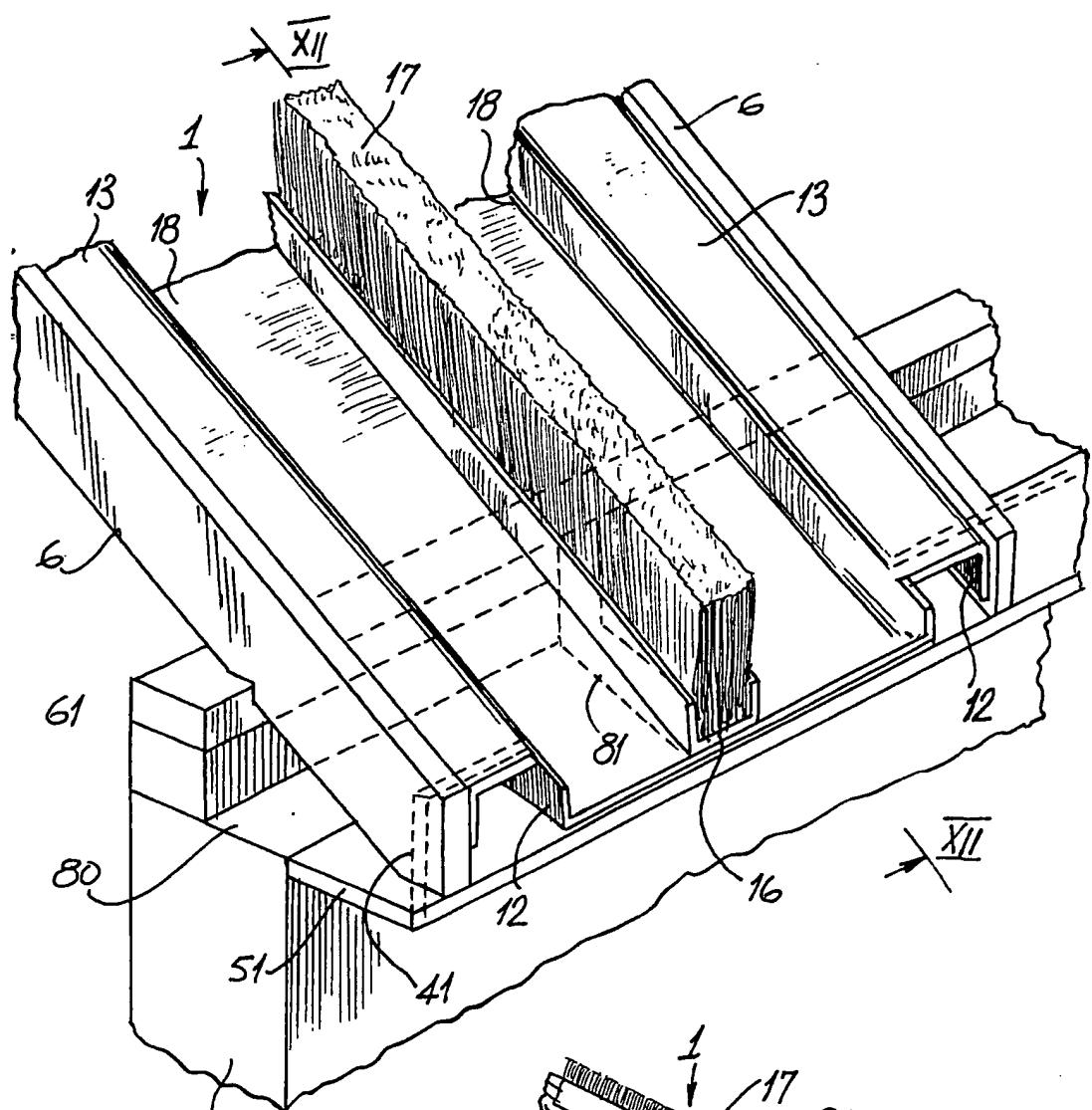


Fig. 4 24

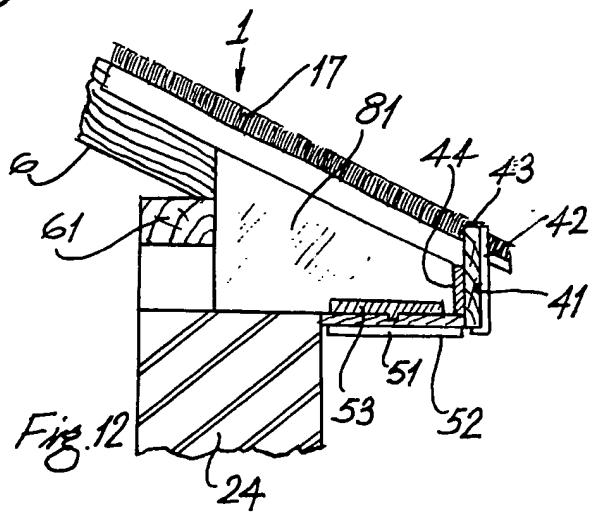


Fig. 12

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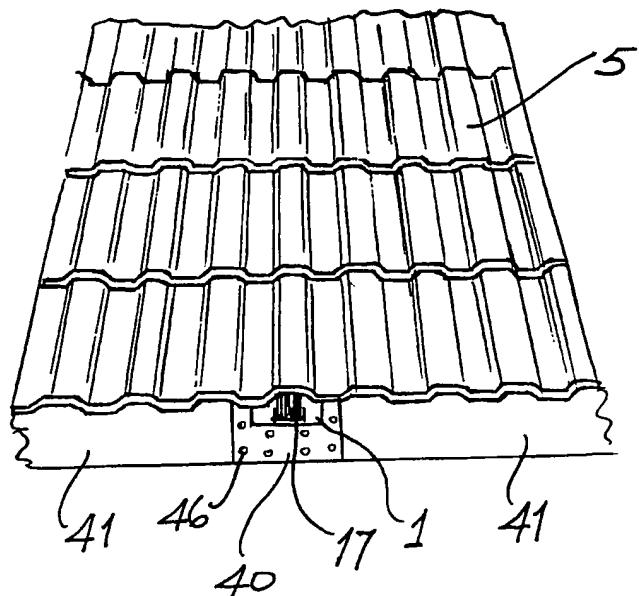


Fig.5

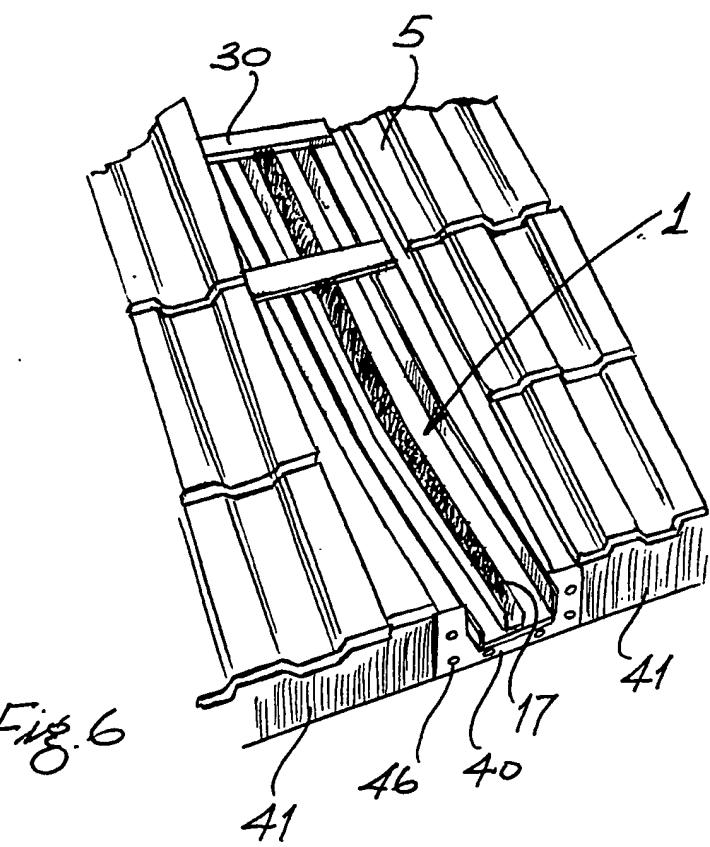
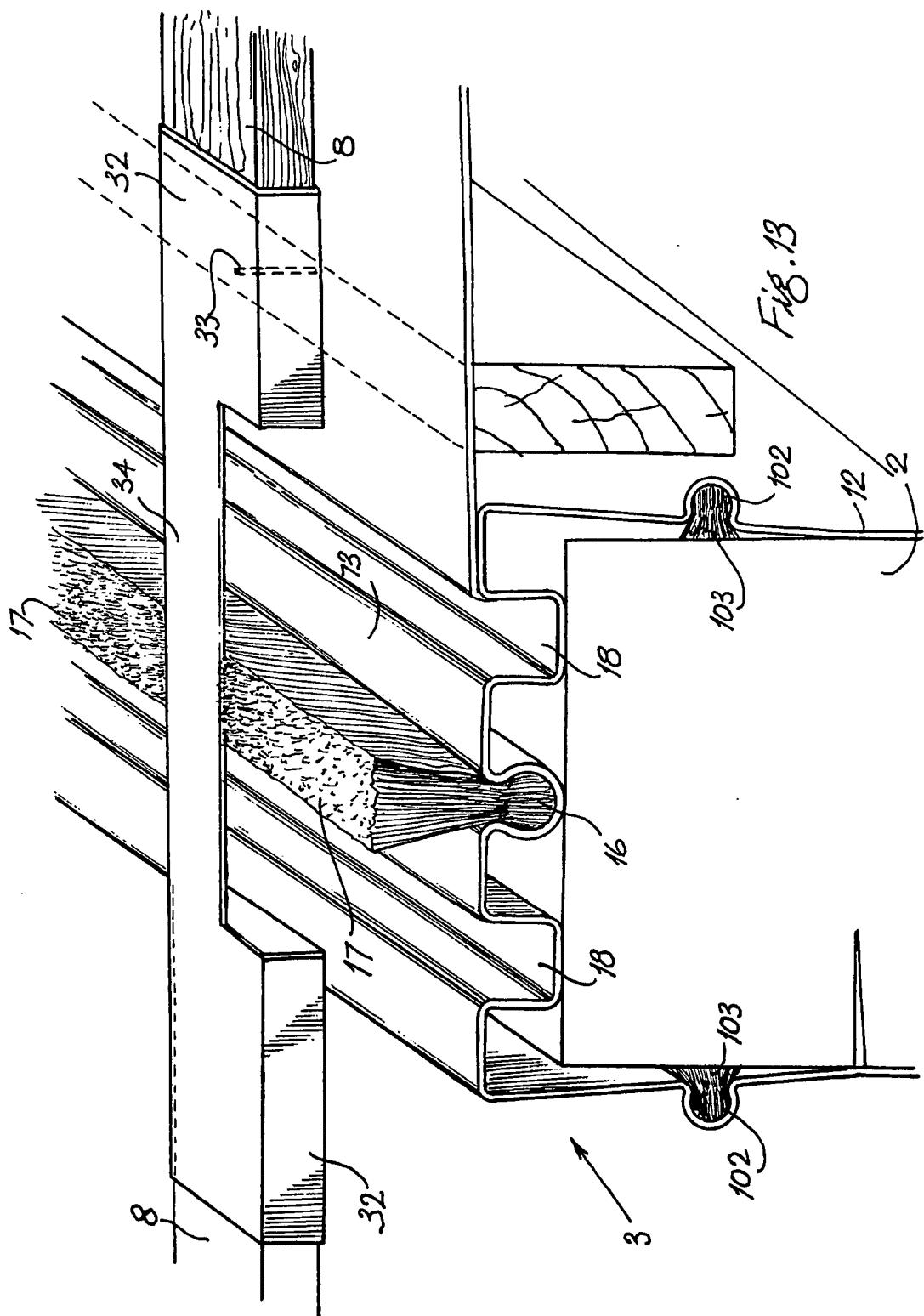


Fig.6

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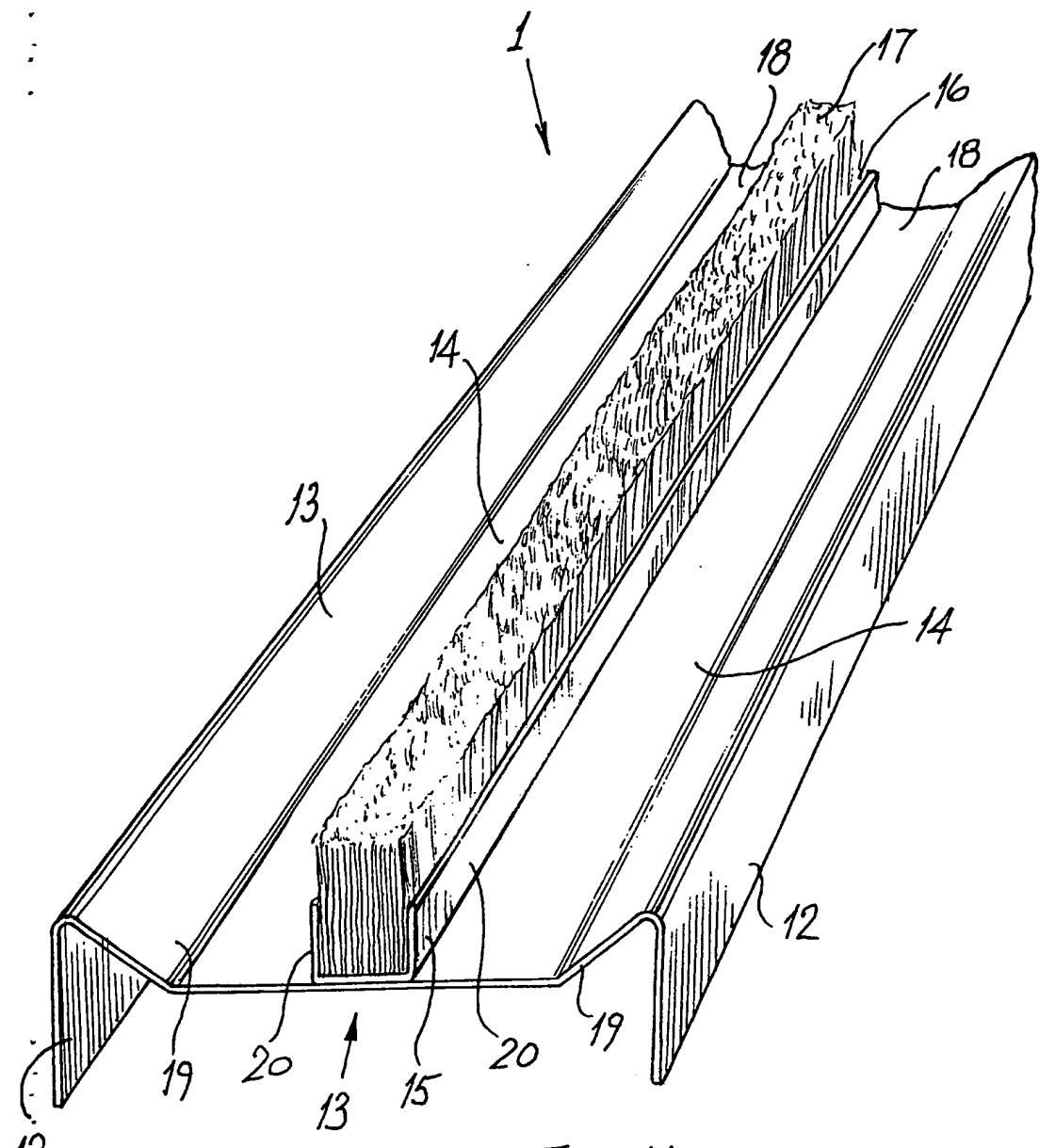


Fig. 14

## SPECIFICATION

## A fire and smoke barrier

5 The present invention relates to a fire barrier, and in particular to a fire barrier for preventing the spread of fire and smoke across gaps between a pair of structural members in a building, for example, between a dividing wall, and the roof of the building.

10 It also relates to a fire break member for joining two flammable members in a building, for example, roofing laths or ridge members adjacent to each wall to prevent the spread of fire through the members across the dividing wall.

15 In many instances in buildings, when structural members of the building are joined, for various reasons, gaps are left between the structural members. Should a fire occur in the building, the fire and smoke rapidly spread from one area of the building 20 to another through these gaps. This is a particular problem in terraced and semi-detached houses. Because of the constructional techniques used, the dividing walls separating the houses, in general do not actually abut the roof. Accordingly, a gap is left 25 between the top of the dividing wall and the roof through which fire and smoke can readily spread. In fact, even with the best constructional techniques, it is generally impossible to achieve a fire and smoke tight joint between the dividing wall and the roof.

30 Indeed, the spread of smoke in many instances is even a greater problem than the spread of fire since very often people are rendered unconscious by the smoke, thus preventing them from escaping from a subsequent fire. There is therefore a need for a fire 35 barrier which will prevent the spread of fire and smoke in buildings.

The present invention is directed towards providing such a fire and smoke barrier.

According to the invention there is provided a fire 40 barrier for sealing a gap between two structural members of a building, the barrier comprising an elongated gasket of fire resistant flexible material mounted in a body member, of fire resistant material, the body member being adapted for mounting 45 on one of the structural members so that the gasket extends across the gap to abut the other structural member to form a seal.

Preferably, the gasket is of fibre material.

In one embodiment of the invention the body 50 member is adapted for mounting on top of a dividing wall dividing two areas of the building, and the gasket extends to abut the roof to seal the gap between the top of the wall and the roof.

Advantageously, the body member is an elongated member of channel shape, having a pair of side webs joined by a connecting web, the side webs being adapted to embrace the structural member, and the connecting web having an outwardly facing elongated longitudinal fixing groove of substantially 60 channel shape from which the gasket protects.

Additionally, the invention provides a fire break member to join adjacent ends of a pair of flammable members to prevent the spread of fire from one member to the other, the member comprising an 65 elongated member, of fire resistant material each

end of which being adapted to engage one of the said flammable members and a fire resistant member intermediate the ends of said elongated member to prevent the spread of fire from one flammable member to the other.

Preferably, the fire resistant member is substantially normal to the elongated member and projects therefrom between the adjacent ends of said flammable members.

75 Alternatively, the fire resistant member is provided intermediate the ends of said elongated member, and forms a portion of said elongated member.

The invention will be more clearly understood 80 from the following description of some preferred embodiments thereof given by way of example only with reference to the accompanying drawings in which:

Figure 1 is a perspective view of a fire barrier 85 according to the invention,

Figure 2 is a partly sectional, perspective view of portion of the fire barrier of Figure 1 mounted on a dividing wall of a building,

Figure 3 is a side view of the barrier of Figure 1 90 also shown mounted on the dividing wall,

Figure 4 is a perspective view of portion of the fire barrier of Figure 1, also on the dividing wall,

Figure 5 is a perspective view of portion of a roof incorporating the fire barrier of Figure 1,

95 Figure 6 is a perspective view of a partly completed roof incorporating the fire barrier of Figure 1,

Figure 7 is a perspective view of a fire break member according to the invention,

Figure 8 is a perspective view of a fire break 100 member according to another embodiment of the invention,

Figure 9 is a perspective view of a fire break member according to a further embodiment of the invention,

105 Figure 10 is a perspective view of a fire break member according to a still further embodiment of the invention shown mounted on portion of the building,

Figure 11 is a perspective view of a fire break block 110 for use with the fire barrier of Figure 1,

Figure 12 is a sectional view on the line XII-XII of Figure 4, and

Figure 13 is a view similar to Figure 2 of a fire barrier according to another embodiment of the 115 invention.

Figure 14 is a view similar to Figure 1 of a fire barrier according to a further embodiment of the invention.

Referring to the drawings and initially to Figures 1 120 to 6 thereof there is provided a fire barrier according to the invention, indicated generally by the reference numeral 1. In Figures 2 to 6 the barrier 1 is shown mounted on the top of a dividing wall 2 which divides two houses of a terrace of houses. The

125 barrier 1 extends the length of the wall 2 on both sides of the apex thereof and seals a gap 3 between the top of the wall 2 and the roofing tiles 5 to prevent the spread of fire and smoke from one house to the next. Roofing rafters 6, roofing felt 7 and tiling laths 8 of the roof are shown in Figure 2.

The fire barrier 1 includes a body member of channel section cold-rolled from sheet metal, having a pair of side webs 12 joined by a connecting web 13. The side webs 12 are adapted to embrace the sides 5 of the dividing wall 2 and are secured thereto. A secondary outwardly facing channel 14 is formed in the connecting web 13 also by cold rolling. A fixing member 15 also of channel section cold rolled from sheet metal is mounted in the secondary channel 14 10 by means of spot welding. The fixing member 15 forms an outwardly facing fixing groove 16 in which is mounted a gasket 17 of fire resistant flexible material, in this case a material sold under the Trade name "Rockwool". The gasket 17 extends from the 15 fixing groove 16 to abut the tiles 5 (see Figure 2), thereby, forming an effective fire and smoke barrier between dividing wall 2 and the tiles 5 of the roof. It will be appreciated that because the gasket is of Rockwool, which is a material formed by flexible 20 fibres, the tiles can be pressed down against the Rockwool or vice versa causing the free ends of the Rockwool to deflect outwardly, thereby ensuring an effective seal between the gasket 17 and the tiles 5.

Two further drain grooves 18 are formed in the 25 secondary channel 14 of the connecting web 13 by side webs 19 of the secondary channel and side webs 20 of the fixing member. The drain grooves 18 receive the free ends of the roofing felt 7 as shown in Figure 2 and also drain away any water which may 30 leak through the tiles adjacent to the divided wall. It will be appreciated that because the roofing felt is an inflammable material it must be divided adjacent to each side of the wall to prevent the spread of fire through the felt.

35 A portion of each side web 12 is removed at 23 to accommodate the front and rear walls 24 of the house, see Figure 3. Needless to say, the fire barrier may be sold in any suitable or desired lengths and the portion removed at 23 could in fact, be removed on 40 site if so desired.

In use, the barrier is mounted on top of the 45 dividing wall 2 as illustrated in Figures 2 to 6. As an added precaution to prevent the possibility of the spread of smoke and fire between the barrier 1 and the top of the wall 2 an additional gasket 21 also of "Rockwool" is mounted on top of the dividing wall 2 beneath the connecting web 13. This is clearly 50 illustrated in Figure 2.

In order to reduce still further, the risk of fire 55 spreading across the dividing wall 2, fire break members according to the invention are provided to join timber members which span the dividing wall 2.

Referring to Figure 2 a fire break member 30 is 60 provided to replace portion of each lath 8 removed above the barrier 1. The member 30 includes an elongated member 31 of steel material, each end 32 of which defines the cross section of the laths, and engage adjacent ends of each lath. The ends 32 are secured to the laths by nails 33. A fire resistant 65 member, in this case formed by a portion 34 of the elongated member 31 intermediate the ends 32 prevents the spread of fire through the laths 8 across the dividing wall 2, and also, in this case, acts as a support for the tiles 5.

65 Figure 7 illustrates a fire break member 40 accord-

ing to another embodiment of the invention, this time for mounting on a facia board 41 of the terraced houses, to prevent the spread of fire along and through the facia board adjacent the wall 2. The fire 70 break 40 is illustrated mounted on the facia board in Figures 5 and 6. The fire break 40 includes an elongated plate member 42.

A fire resistant member 44 also of steel projects 75 normal from the plate member 42 and engages a saw cut which is formed through the facia board 41. Holes 46 are provided for securing the member 40 to the facia board 41. Accordingly, the fire break 40 engages the adjacent ends of the facia board 41 and the fire resistant member 44 prevents the spread of 80 fire through the facia board. A notch 45 is removed from the member 40 to accommodate the drain grooves 18 of the barrier 1 on passing through the facia board 41 to drain into a gutter 47, see in particular Figures 3, 5 and 6.

85 Figure 8 illustrates a fire break 50 according to another embodiment of the invention. This particular member is adapted for mounting on a soffit board 51 of the houses adjacent to the dividing wall 2 beneath the fire barrier 1. The member 50 comprises an elongated steel plate 52 which abuts the soffit 51 and a fire resistant plate member 53 which engages a saw cut in the soffit 51 to prevent the spread of fire through the soffit. Holes 54 are provided in the plate 52 for securing the fire break 95 member 50 to the soffit 51. Additional ventilating holes 55 are also provided in the plate 52. Corresponding ventilating holes may be provided in the soffit board 51 for ventilating the attic space. A further advantage of having the ventilating holes is 100 that they will allow smoke to exit from the attic in case of a fire, thereby alerting passers-by to the fire.

Figure 9 shows another fire break member 60 for mounting on the wall plate 61 of the houses where it crosses the dividing wall 2 adjacent the fire barrier 1. 105 This member comprises an elongated steel plate 62 with side member 63 which embrace the wall plate 61. A fire resistant plate 64 normal to the plate 62 engages a saw cut formed in the wall plate 61 to prevent the spread of fire through the wall plate 61.

110 Holes 65 are provided to secure the member 60.

Another fire break member 70 is illustrated in Figure 10. This member 70 is adapted for mounting on a ridge member 71 where it passes over the dividing wall 2. The member 70 includes an elongated plate member 72 of steel and side members 73 which engage the ridge member 71. A fire resistant plate 74 also of steel material projects through a saw cut in the ridge member to prevent the spread of fire through the ridge member 71. Holes 75 are provided 115 for securing the member 70 to the ridge 71.

In order to prevent the spread of smoke and fire 120 through a cavity 80 formed between the facia board 41 the soffit board 51 the wall plate 61 and the fire barrier 1, a further barrier member, a fire break block 81 is provided to seal the cavity 80. The block 81 is shown in Figure 11. The block 81 is illustrated mounted in the cavity 80 in Figure 12 and also shown in broken lines in Figure 4. The member 81 comprises a plurality of layers 82 of Rockwool material which 130 are bonded together. The layers 82, however, may

be easily peeled apart to adjust the depth of the block so that a block of any desired depth may be readily and easily obtained. A layer 82 being peeled away from the remainder of the block 81 is illustrated by broken lines in Figure 11.

A pair of slots 83 is provided in the block 81 to engage the fire resistant plate members 44 and 53 of the fascia and the soffit board fire break members 40 and 50 respectively. Thereby, this prevents the passage of fire and smoke through the cavity 80. In use, when the dividing wall 2 of the house is built up to roof level. The layer 21 of Rockwool is positioned and the fire barrier 1 is mounted on top of the wall 2 as described. The roof is then constructed and saw cuts are formed in the wall plates 51, ridge member 71 and subsequently in the fascia and soffit board 41 and 51 respectively. The roofing felt 7 is then laid across the rafters 6 as illustrated in Figure 2. The free ends of the felt 7 terminate in the drain grooves 18 also as illustrated in Figure 2. The roofing laths terminating on each side of the dividing wall 2 are joined by the fire break members 30. The fire break member 70 is then secured to the ridge member 71 and the fire break member 60 is secured to the wall plate 61. The block 81 is secured in the cavity 80 and the fire break members 40 and 50 are secured in the fascia board and the soffit board respectively so that the fire resistant plates 44 and 53 projects through the respective boards 41 and 51 to engage the slots 83 in the block 81.

The tiles are then laid on the roof and secured. A good seal between the gasket 17 and the tiles 5 is formed by moving the fire barrier 1 upwardly on the wall 2 to ensure that the gasket 17 securely abuts the tiles 5. The side webs 12 are then secured to the wall 2 by masonry bolts or nails or both. It will be appreciated that because of the flexibility of the gasket 17, the gasket is able to accommodate step changes in the width of the gap as a result of the overlapping of the tiles, and also is able to accommodate the fire break members 30.

Referring now to Figure 13 there is illustrated a fire barrier according to another embodiment of the invention. This barrier is substantially similar to the barrier 1 already described, and like components are identified by the same reference numeral. In this embodiment of the invention the fixing groove 16 for the gasket 17 is formed in the connecting web 13 by cold rolling. Similarly, draining grooves 18 are also formed by the cold rolling in the web 13. An additional feature of this barrier is that two further inwardly facing grooves 102 are provided one on each side web 12 to accommodate further gaskets 103. The gaskets 103 are also of Rockwool and project from the grooves 102 to abut the sides of the wall 2. This will be appreciated ensures that smoke and fire cannot pass between the barrier 1 and the wall 2. Essentially, this eliminates the need for the additional gasket 21 which is illustrated in Figure 1.

A fire barrier according to a further embodiment of the invention is illustrated in Figure 14. This fire barrier is substantially similar to that described with reference to Figures 1 to 6, and similar parts are identified by the same reference numeral. This fire barrier is also manufactured from sheet metal and is

formed by cold rolling. It also comprises a secondary channel 14, however, the essential difference between this barrier and that illustrated in Figure 1 is that the side webs 19 forming the secondary channel 14 are inclined at an angle of approximately 45°. The inclination of the side webs 19 accommodates the forming of the body member.

All the fire barriers and fire break members just described are manufactured from steel or sheet metal, and are subsequently galvanised to avoid corrosion. Needless to say, it will be appreciated that they could be manufactured from other fire resistant materials if desired, and similarly, if desired the galvanising could be omitted.

The advantage of the present invention are many. As well as preventing the spread of fire and smoke from one house to its adjoining house, the fire barrier and in particular the fire break member also retard and in many cases prevent the spread of dry rot from one house to the next. Additionally, the invention facilitates house maintenance. For example, where a fascia board or soffit board has to be replaced on one house only, this can now readily easily be done, since the soffit and fascia board are cut through adjacent the dividing wall to accommodate the fire resistant plates 44 and 53. Similarly, in the case where a lath has to be replaced, this can also be done without effecting the neighbouring house.

A further advantage of the invention is that it provides ventilation into the attic. In cases where ventilating holes are provided in the soffit board to correspond with the ventilating holes 55 in the fire break member 50, direct ventilation into the attic is provided. Additionally, the fire barrier accommodates roof settlement. It will be appreciated, that because the gasket 17 is flexible, if there is any settlement of the roof relative to the dividing wall 2, this is accommodated by the gasket 17. It will be appreciated that the gasket 17 will deform to accommodate the settlement. This overcomes the problem in some existing structures where roof settlement takes place the portions of the roof over the dividing walls are supported on the dividing walls, while the portions spanning between the dividing wall sag. A further advantage of the invention is that it improves the sound proofing between attic areas of adjoining houses.

Although the fire barrier and fire break members have been described for use in a house under construction, it will be appreciated that they could also be used in a house which has been constructed. In which case the tiles above the dividing wall would be removed from the roof and the laths cut to terminate on either side of the dividing wall. The fire barrier and fire break members would then be fitted as already described. Needless to say, the slots in the respective members to accommodate the fire resistant plate of each member would have to be provided so that the fire break member could be mounted.

Although, fire barriers and fire break members have been described for use in the terrace of houses, it is envisaged that in certain cases only a fire barrier may be used, without departing from the scope of

the invention.

Furthermore, it is envisaged that the fire barrier and fire break members could be used in a semi-detached house or in any other building. Indeed, it is 5 envisaged that the fire barrier could be used in other applications besides sealing a gap between a dividing wall and a roof, for example, a gap between walls, a gap between other structural members or the like.

10 Needless to say, it will be appreciated that although the fire barrier has been described as having a body member of channel section, the body member could be of any suitable section for example, a flat plate member, with a fixing groove for the gasket could be used. In which case the plate member would be mounted directly on top of the dividing wall. Furthermore, it will be appreciated that the gaskets could be manufactured from other fire 15 resistant materials besides Rockwool. For example, 20 an asbestos fibre material.

It is envisaged that the fire break member for joining the adjacent ends of the laths instead of being formed in one piece could be formed in two longitudinal sections, one of which telescopes into 25 the other for adjustment to accommodate varying widths of dividing walls. Needless to say, it will be appreciated that fire break members of other shapes and constructions could be used without departing from the scope of the invention.

30 It is further envisaged that in certain cases the fire barrier 1 could be mounted on top of the wall without the need for the additional gasket 21. It is believed that where the top surface of the dividing wall is sufficiently smooth adequate sealing between 35 the body member of the fire barrier and the top wall would be achieved without the need for the additional gasket.

It will be further appreciated by those skilled in the art that while the fire break members for the soffit 40 and facia boards have been illustrated mounted on the outer surface of the respective boards, they could equally well be mounted on the inner side without departing from the scope of the invention.

Furthermore, it will be appreciated that although 45 the fire barrier has been described as having drain grooves, these are not necessary and in certain cases may be left out without departing from the scope of the invention.

## 50 CLAIMS

1. A fire barrier for sealing a gap between two structural members of a building, the barrier comprising an elongated gasket of fire resistant flexible material mounted in a body member of fire resistant material, the body member being adapted for mounting on one of the structural members so that the gasket extends across the gap to abut the other structural member to form a seal.
- 60 2. A fire barrier as claimed in claim 1, in which the gasket is of a fibre material.
3. A fire barrier as claimed in claims 1 or 2 in which the body member is adapted for mounting on top of a dividing wall dividing two areas of the 65 building, and the gasket extends to abut the roof to

seal the gap between the top of the wall and the roof.

4. A fire barrier as claimed in any of the preceding claims in which the body member is an elongated member of channel shape, having a pair of side webs joined by a connecting web, the side webs being adapted to embrace the structural member, and the connecting web having an outwardly facing elongated longitudinal fixing groove of substantially channel shape from which the gasket projects.

70 5. A fire barrier as claimed in claim 4 in which two further elongated drain grooves of substantially channel shape, outwardly facing from the connecting web extend longitudinally on either side of the fixing groove to receive roofing felt.

75 6. A fire barrier as claimed in claims 4 or 5 in which a secondary outwardly facing channel is formed in the connecting web of the body member, and the fixing groove is formed by a fixing member of channel section mounted in the secondary channel,

80 7. A fire barrier as claimed in any of the preceding claims in which the barrier also prevents the 85 passage of smoke thereacross.

8. A fire barrier as claimed in any of the preceding claims and a wall on which the fire barrier is mounted.

9. A fire barrier as claimed in claim 8 in which a 95 further elongated gasket of fire resistant material is mounted on top of the wall between the wall and the body member.

10. A fire barrier as claimed in any of the preceding claims in which the gasket material is a material sold under the Trade name "Rockwool".

11. A fire barrier substantially as described herein with reference to and as illustrated in Figures 1 to 6 of the accompanying drawings.

12. fire barriers substantially as described herein 105 with reference to and as illustrated in Figures 13 and 14 of the accompanying drawings.

13. A fire break member to join adjacent ends of a pair of flammable members to prevent the spread of fire from one member to the other, the member 110 comprising an elongated member, of fire resistant material, each end of which being adapted to engage one of the said flammable members and a fire resistant member intermediate the ends of said elongated member to prevent the spread of fire from 115 one flammable member to the other.

14. A fire break member as claimed in claim 13 in which the end of the elongated member defines the cross sectional area of the said flammable members and embraces the flammable members.

120 15. A fire break member as claimed in claims 13 or 14 in which the fire resistant member is substantially normal to the elongated member and projects therefrom between the adjacent ends of said flammable members.

125 16. A fire break member as claimed in any of claims 13 to 15 in which the fire break member is adapted for mounting on a ridge member of a roof.

17. A fire break member as claimed in claims 13 or 14 in which the fire resistant member is provided 130 intermediate the ends of said elongated member,

and forms a portion of said elongated member.

18. A fire break member as claimed in claim 17 in which the fire break member is adapted for mounting on a tiling lath.

5 19. A fire break members substantially as described herein and with reference to and as illustrated in Figures 1 to 13 of the accompanying drawings.

10 20. A fire break member as claimed in any preceding claim and a tiling lath, or ridge member, or soffit board, or facia board on which the bridging member is mounted.

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Printed for Her Majesty's Stationery Office, by Croydon Printing Company

Limited, Croydon, Surrey, 1982.

Published by The Patent Office, 25 Southampton Buildings, London,

WC2A 1AY, from which copies may be obtained.